Social Indicators of Gentrification Pressure in Fishing Communities: A Context for Social Impact Assessment

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The use of social indicators in this analysis of coastal communities enhances the evaluation of the combined impacts of changes in fisheries management regulations and gentrification for fisheries social impact assessments. Increasing population pressure, declining fish stocks, and the attractiveness of natural amenities have all led to demographic shifts and economic transformations for many coastal communities dependent on fishing. This impact of "gentrification" on the commercial fishing industry often precipitates a move toward non-marine based economies that can displace local residents and their dependence on fishing as a way of life with resulting impacts to local economies and cultures. Drawing on the United States Census, National Marine Fisheries Service, and other secondary data sources, social indicators were developed for 2,948 coastal communities in the Eastern United States and Gulf Coast and were used to evaluate gentrification pressure in select communities highly engaged in fishing. We anticipate this methodology, when groundtruthed and then combined with time-series assessments, will lead to improvements in the assessment of fishing community vulnerability and resilience for the conduct of fisheries social impact assessments.

Keywords fishing communities, gentrification, social impact assessment, social indicators

Introduction

The historical evolution and cumulative effects of changes in fishery management regulations over a prolonged period often requires that fishermen, their families, and communities adapt to significant change. For communities these changes include disruption to both social structure and infrastructure (Olson 2010). Many external factors (forces of change) affect whether or not community adaptation in the face of such change is possible (Pollnac et al. 2008). Here we focus on a methodology for assessing a growing trend of coastal gentrification driven primarily by an increasing coastal population, changing demographics and a desire for access to natural amenities.

In the United States (U.S.), consideration of the social impacts of fishery regulation is a mandatory component of all Environmental Impact Statements for Federal Fishery Management Plans (MSA 1996). While Social Impact Assessments (SIAs) commonly discuss factors important to sustaining communities, such as financial dependence on landings, most current analyses of community vulnerability and resilience do not account for the compounding effect of external forces of change. The time and cost of acquiring qualitative and quantitative data on external forces and their effect on community vulnerability, resilience and well-being has limited the effectiveness of SIAs. While there has been some progress in the development of indicators for sustainability of marine fisheries at the national and regional levels, "there has been little attention paid to establishing frameworks at the local or community level" (Boyd and Charles 2006, 238).

The Pollnac et al. (2008) fisheries SIA model suggests that external forces affect (and are affected by) management regulations and social-community attributes, such as resilience and vulnerability. Resilience refers to the capacity of a community to adapt to change and still maintain function without ceasing to exist (Walker et al. 2004). Vulnerability can be seen as the opposite of resilience (Folke 2006) or more broadly to contain the characteristics of exposure, sensitivity, and capacity of response to change or perturbation (Gallopín 2006). Community well-being has been described as dependent on the interrelationship between individuals, families, and external forces or conditions (Mederer 1999).

Gentrification is an external force which can be a key source of coastal community vulnerability (Jacob et al. 2010; Clay and Olson 2008), frequently leading to the out-migration of traditional residents and the in-migration of new residents (often retirees) which can fragment social networks within communities (Colburn and Clay 2011). Verified rapid assessment methodologies are needed to permit the consideration of gentrification and other external forces of change within SIAs. Such methodologies should be able to discriminate along critical axes of vulnerability, resilience, and well-being, over time in order to predict the impacts of fisheries management regulations.

Here we provide an overview of the impact of gentrification on coastal communities then describe a method for developing social indices from secondary data and apply them to fifteen select coastal communities in the Northeast and Southeast coast of the United States. Finally, the conclusion suggests a framework to guide application of these indicators for enhancing social impact assessment of management actions more generally.

Background

Coastal Gentrification

Coastal communities have desirable natural amenities such as scenic land and seascapes that make them highly vulnerable to external forces such as in-migration, demographic shifts, and changes in economic activity (Jacob et al. 2010). Continued population growth in the finite area of coastal counties is a growing concern (Crossett et al. 2004). Increased population pressure from the in-migration of new residents (frequently retirees) seeking shorefront property can lead to gentrification. As higher income residents buy waterfront for its amenities, land values increase, leaving resource-dependent activities less valued or priced out of waterfront (Coastal Enterprises, Inc. 2002), "changing the essential character and flavor of a community" (Yagley et al. 2005, 1).

Gentrification may have different characteristics in urban, exurban, and rural communities (Lees 2000). Rural and exurban gentrification often involves new development, while

urban gentrification is characterized by the rehabilitation of existing structures (Yagley et al. 2005). Coastal communities can be urban, exurban, or rural, but three common elements of gentrification are reuse of waterfront structures, construction of new housing and growth within the services sector. Urban sprawl (migration to the edge of cities) can contribute to gentrification by placing pressure on housing markets in coastal communities that are close to cities (Yagley et al. 2005).

Gale (1991) developed a typology of coastal communities that helps distinguish between the gentrification experiences of various types of resource-dependent coastal communities, and places fishing dependent coastal communities into a broader coastal context. Most fishing communities would fit Gale's category of "Natural Resource Manufacturing and Administration," in which the economic base revolves around the exploitation of water-based natural resources. Especially noteworthy to Gale's discussion is the impact of a "second-generation growth machine." Often made up of non-locals and driven by urban markets, this new growth machine tends to disrupt the old power structure and displaces established, less powerful residents. This type of coastal gentrification is typical along the coastal United States and transforms many natural resource communities to dependence upon an entirely different economic base such as tourism and service occupations. Such economic redevelopment displaces commercial fishermen, pushing individual, familial, and community identity away from fishing (Jepson 2004).

Vulnerability of Fishing Communities to Gentrification

Fishery management regulations, fish stock health, and increasing population pressure in coastal communities challenge the commercial fishing industry's viability in traditional waterfront locations. Increasingly restrictive and frequent regulations reduce fishermen's flexibility to adapt to change, weakening the economic base. For many commercial working waterfronts, gentrification has pushed traditional waterfront businesses, like fish houses and bait dealers, away from their customary location along the coast. This dislocation and disruption in local economies can have important implications for those who live and work in these communities. Repurposing land that supports a strong working waterfront from marine to non-marine-related uses weakens a commercial fishing port's capability to withstand other types of social disruption (Hall-Arber et al. 2001).

Where coastal gentrification occurs, marine recreation and tourism driven activities of new residents are replacing other resource dependent activities such as commercial fishing, creating competing views of the environment (Jacob and Witman 2006; Lamarque 2009) and transforming the significance of marine coastal resources (Valdes-Pizzini 1990). It is rare to find land use controls that would protect the working waterfront during periods of restricted fishing effort driven by management regulations or market forces. Community governance may then become dominated or influenced by new and different values, as characterized by changes in the power base of communities from those involved in the fishing industry to "outsiders" with white-collar jobs, those engaged in tourism-related services, and/or those that do not value a working waterfront (Hall-Arber et al. 2001). Changes in the power base may force traditional inhabitants to relocate to the periphery or even outside of their geographic community of origin as they lose their voice in governance.

Colburn and Clay (2011) identified "a synergistic relationship between gentrification trends, reduced capacity to fish and community identity with fishing in the Northeast U. S.," as previously identified by Hall-Arber and colleagues (2001) in New England and Johnson and Orbach (1990) in Florida. From a demographic and economic perspective, individuals with an eroded sense of identity in fishing may have a more dismal outlook for the future

economic and cultural importance of fishing in their community. While it is often assumed that fishermen can easily transition to other non-fishing employment, the tight fit between job satisfaction and personality characteristics of commercial fishermen is evidence to the contrary (Pollnac and Poggie 1988; 2006; Pollnac et al. 2008). Loss of fishing as a way of life coupled with lowered job satisfaction of fishermen has important consequences for both individual and community well-being. The diminished importance of fishing makes it vulnerable to being incorporated into community identity as a romanticized re-imagination of the historical past, commoditized to attract tourists (Jacob and Witman 2006, 395) and embraced by gentrification.

Measuring Gentrification

Building on the work of Jacob et al. (2010) and GSAFFI (2010) we explore the utility of using secondary data to create quantitative measures that allow for a more empirical look at the concept of gentrification and how it relates to fishing communities and dependence upon marine natural resources. In doing so, we provide a methodological tool that measures the phenomenon in the present context and lays the groundwork for a longer-term analysis to determine possible trends in gentrification and fishing dependence.

Methods

Data Collection

Community-level data for 2,948 coastal communities were collected from the U.S. Census Bureau's American Factfinder website and the American Community Survey datasets. Data are at the place level (census designated place or other geography where applicable), for all communities in coastal counties along the U.S. Eastern Seaboard and Gulf Coast. Other variables, including National Marine Fisheries Service (NMFS) fisheries data, were also assembled at the place level and included in the analysis.

Index Construction and Criteria

In creating relevant measures of commercial fishing dependence and coastal gentrification, we chose variables that reflected some aspect of each construct as described within the literature (Jacob et al. 2010). Using principal component analysis and a single solution factor analysis we empirically tested the latent structure of each index. All indices were expected to meet the following criteria for index construction: a Kasier-Meyer-Olkin measure of sampling adequacy above .500; factor loadings above .350; Bartlett's test of sphericity significance above .05; an Armor's Theta reliability coefficient above .500; and explained variance of at least 45% for all indices. To reach a single factor solution, comparable substitute variables were used to maintain unidimensionality of the index when multiple factors appeared.

For the evaluation of fishing dependence, we decided based on prior experience that indices of fishing engagement and reliance were appropriate. The indices developed for the evaluation of gentrification are retiree migration, urban sprawl, and natural amenities as these three components seemed integral to the concept (see below). The five indices all have eigen values over 1 and factor loadings ranging from .388 to .970 (Table 1). Armor's theta reliability coefficients for all indices range from .621 to .907, suggesting an adequate level of internal consistency for a four-item index.

Table 1
Social indices with factor loadings and variance explained

	Factor Loading	
a. Commercial Fishing Reliance Index		
Value of landings per capita	0.830	Variance Explained
Commercial permits per capita	0.679	49.87
Dealers s per capita	0.598	Armor's Theta
% in agriculture, forestry and fishing	0.697	0.665
b. Commercial Fishing Engagement Index		
Absolute pounds of landings	0.906	Variance Explained
Absolute value of landings	0.861	57.43
Number of commercial permits	0.575	Armor's Theta
Absolute number of dealers with landings	0.636	0.882
c. Retiree Migration Index		
Households with persons over 65	0.950	Variance Explained
% population receiving social security	0.951	78.60
% population receiving retirement income	0.765	Armor's Theta
% population in labor force	–0.867	0.907
d. Urban Sprawl Index		
Population density	0.388	Variance Explained
Nearest city with a population of >50K	–0.669	49.96
Cost of living index	0.896	Armor's Theta
Median home value	0.772	0.661
e. Natural Resource Amenities Index		
Rental vacancy rate	0.770	Variance Explained
% homes vacant 2010	0.822	48.87
Boat launches per capita	0.605	Armor's Theta
% water cover	0.489	0.621

Results

Fishing Dependence Indices

Commercial Fishing Reliance Index. The commercial fishing reliance index is a measure of commercial fishing activity relative to community size. It provides a single factor to assess the degree to which commercial fishing supports a coastal community's employment and economy. The index consists of four variables: value of landings per 1,000 persons; commercial permits per 1,000 persons; dealers with landings per 1,000 persons; and percent employed in agriculture, forestry and fishing. The nearly 50% of variance explained by these four variables combined with an Armor's Theta reliability coefficient of 0.665 demonstrated that this index was a reasonable measure of commercial fishing reliance (Table 1a).

Commercial Fishing Engagement Index. The commercial fishing engagement index is an absolute measure of fishing activity in each community. It provides a single factor to assess

the scale of fishing activity in each community relative to other communities. The index consists of four variables: pounds of landings; value of landings; number of commercial fishing permits; and number of dealers with landings. These four variables provided a reasonable measure of commercial fishing engagement with over 57% of the variance explained and an Armor's Theta reliability coefficient of 0.882 (Table 1b).

Gentrification Indices

The three indices developed here include variables related to some of the forces that drive gentrification: migrating retirees, growing populations, and natural amenities (Yagley et al. 2005; GSAFFI 2010).

Retiree Migration Index. Population increases from the in-migration of retirees change the age structure of communities (GSAFFI et al. 2010). The retirees may also bring in new sources of income to the community. However, if the retirees have no prior connection to a community (family history, prior residence) they may bring views on local infrastructure funding (schools, development) that can adversely affect economic stability of a community (Reeder and Glasgow 1990). Our retiree migration index consists of four variables: percent of households with one or more persons over 65 years of age; percent of population receiving social security; percent of population receiving retirement income; and the inverse percentage of the population in the labor force (Table 1c). The inverse percentage of population in the labor force (negative factor loading) weights communities with a low labor force higher on the retiree migration index than communities with a larger labor force. This index provides a single factor to assess the proportion of retirees in a community compared to other communities and has an explained variation of over 78% with an Armor's Theta reliability coefficient of 0.907. While this is a static measure (reflects the number of retirees in a community at the time of the census) it will eventually be used with time series data and regional data to explore in- or out-migration of retirees.

Urban Sprawl Index. Urban sprawl occurs when the inhabitants of cities migrate to surrounding areas, reducing the overall density of the metropolitan area (GSAFFI et al. 2010). New inhabitants of areas affected by urban sprawl build homes on larger parcels of land with higher home values than existing housing stock. Urban sprawl resembles gentrification in that a rural or city identity can be replaced by a suburban lifestyle. The growth in housing markets is usually inequitable. Affordable housing can be replaced by new housing developments of higher valued homes and increasingly restrictive zoning policies that are at odds with the needs of original residents (Yagley et al. 2005). Our measure of urban sprawl includes population density; the inverse of the distance to the nearest city with a population of 50,000 or more; cost of living index; and median home value (Table 1d). The inverse of distance to a city (a negative factor loading) weights communities closer to cities higher on urban sprawl than those further away. Our measure of urban sprawl provides a single factor to assess the density and cost of housing relative to other communities and had an explained variation of over 49% with an Armor's Theta reliability coefficient of 0.661.

Natural Resource Amenities Index. Key characteristics of natural resource amenities include access to "water, forests, mountains, and scenic vistas" (Yagley et al. 2005, 9). Coastal communities with high levels of natural resource amenities (such as views, water access, and productive sports fishing) often experience a decrease in commercial natural resource production and a parallel increase in services to support visitors (GSAFFI et al. 2010,

26). Most high amenity communities with marine resources tend to have high levels of resources associated with water areas. Two indicators of high natural resource amenities are the percent of water coverage and rental and home vacancy due to absentee owners of second homes or vacation homes (GSAFFI et al. 2010). Such areas are often destinations for tourism and seasonal activities (Yagley et al. 2005). Our natural resource amenities index consists of: the rental vacancy rate; percent home vacancy; number of boat launches per 1,000 population; and percent of water coverage as part of overall land area (Table 1e). This index provides a single factor to assess the natural resource amenities in a coastal community relative to other communities and has over 48% of explained variation with an Armor's Theta reliability coefficient of 0.621.

Discussion

When the factor scores for each index are plotted for all fifteen communities for both fishing reliance and fishing engagement there are distinct differences (Figure 1). Although the range of values differs for each index, the relationship between the two indices establishes a profile for each community and their distance from the mean is informative. We chose one standard deviation as our threshold for significance for comparison across communities. New Bedford, MA, the highest grossing port in this sample, is highly engaged in commercial fishing as expected, with the highest factor loading, but has a relatively modest level of fishing reliance (although still significant because landing values are so high). As expected,
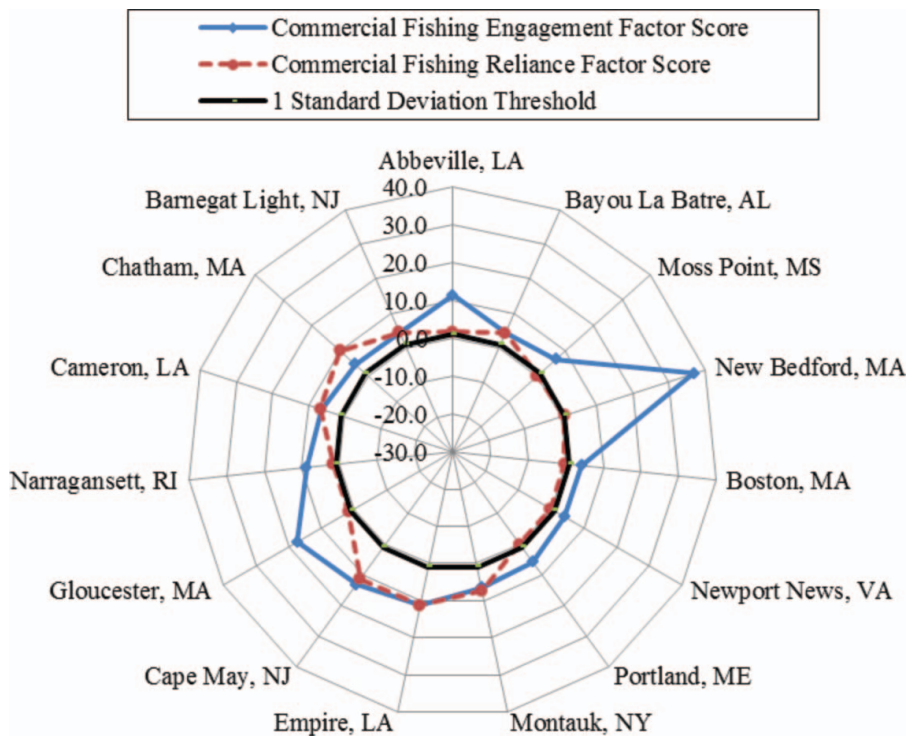

Figure 1. Commercial Fishing Engagement and Reliance Index Factor scores plotted by community (color figure available online).
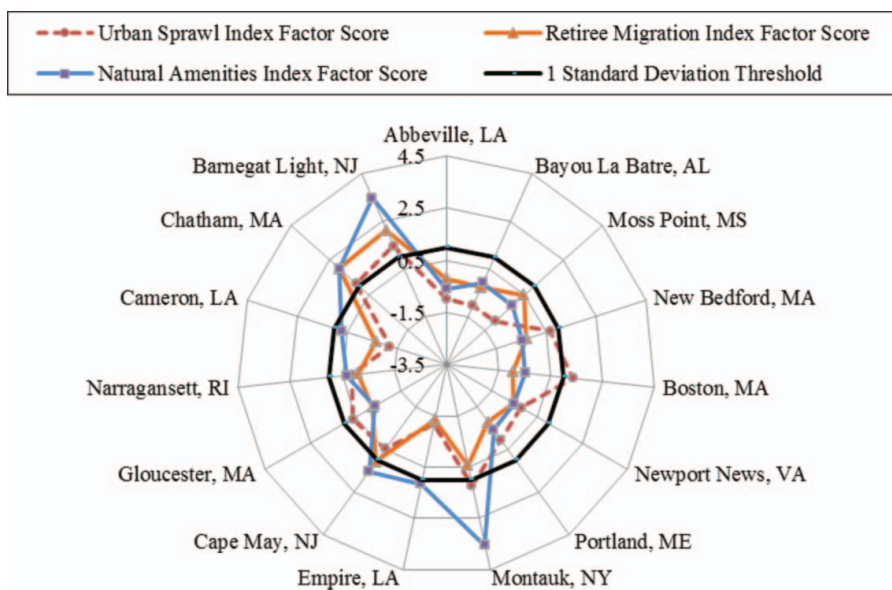
Figure 2. Gentrification Index Factor scores plotted by community (color figure available online).

those communities with larger populations, like Portland, ME and Boston, MA tend to be more economically diverse and show much less reliance upon commercial fishing. Smaller communities like Empire, LA and Cape May, NJ, on the other hand, tend to have less economic diversity and demonstrate more reliance on fishing. These latter two communities, along with a few others, also show a correspondingly high level of engagement and therefore may be considered more dependent on commercial fishing and potentially more vulnerable to changes in fishing regulations.

The three gentrification indices display distinctive relationships for each of the fifteen communities (Figure 2). Communities like Barnegat Light–Long Beach and Cape May, (both in New Jersey) show similar trends in all three measures, as do Chatham, MA and Narragansett, RI. Because these communities show higher factor scores on all three measures it suggests that these and other like communities may be more vulnerable to gentrification pressure. Other communities show strong relationships with some but not all indices. For example, Montauk, NY, Empire, LA and Cameron, LA show strong relationships with the natural amenities index, but not the other two conceptual measures of gentrification. This may be explained by their rurality and isolation, along with small populations. Urban sprawl tends to be more highly associated with larger populations, but not always, as Barnegat Light–Long Beach, NJ and Cape May, NJ have populations of approximately 3,500. Those communities where all three measures directionally intersect through higher factor scores are candidates for further exploration with regard to gentrification.

Factor scores were dichotomized based upon the score being at least one standard deviation above or below the mean for each index. We then summed the dichotomized scores, creating a gentrification and commercial fishing sum score for each community (Table 2). Two of the fifteen communities, Chatham, MA and Barnegat Light–Long Beach, NJ, were both one standard deviation above the mean for all three indices; Montauk, NY and Cape May, NJ had factor scores one standard deviation above the mean on two of

Table 2
Fishing dependence and vulnerability to gentrification

Communities	Commercial fishing activity			Gentrification			
	Fishing engagement	Fishing reliance	Fishing sum	Retiree migration	Urban sprawl	Natural amenities	Gentrification sum
Chatham, MA	1	1	**2**	1	1	1	**3**
Barnegat Light, NJ	1	1	**2**	1	1	1	**3**
Cape May, NJ	1	1	**2**	1	0	1	**2**
Montauk, NY	1	1	**2**	0	1	1	**2**
Empire, LA	1	1	**2**	0	0	1	**1**
Boston, MA	1	0	**1**	0	1	0	**1**
New Bedford, MA	1	1	**2**	0	0	0	**0**
Gloucester, MA	1	1	**2**	0	0	0	**0**
Abbeville, LA	1	1	**2**	0	0	0	**0**
Narragansett, RI	1	1	**2**	0	0	0	**0**
Moss Point, MS	1	0	**1**	0	0	0	**0**
Cameron, LA	1	1	**2**	0	0	0	**0**
Portland, ME	1	0	**1**	0	0	0	**0**
Bayou La Batre, AL	1	1	**2**	0	0	0	**0**
Newport News, VA	1	0	**1**	0	0	0	**0**

the three indices. This suggests that these four communities are between vulnerable and somewhat vulnerable to gentrification.

All of the selected communities have fishing engagement factor scores one standard deviation above the mean and eleven have fishing reliance factors scores one standard deviation above the mean. Therefore, eleven of these communities can be considered highly invested in commercial fishing and potentially vulnerable to social disruption if changes in fishing regulations negatively affect the industry. With that in mind, the four communities that are also experiencing gentrification pressures may be even more vulnerable to social disruption—due to the presence of this outside factor that has been shown to displace fishing families and infrastructure with long-term consequences (Shivlani 2009).

Conclusion

Fishing communities are impacted by regulations affecting fishermen and their families. Federal regulations require that impacts to communities be covered in SIAs, however, external forces of change such as gentrification are rarely addressed in any systematic way. Here five indices were developed from available secondary data to assess commercial fishing activity and gentrification in 2,948 coastal communities in the United States. To evaluate the utility of these indices, a preliminary assessment was conducted on the fifteen communities in the sample most highly engaged in commercial fishing. Of these fifteen, four were identified as experiencing gentrification pressure and therefore could be considered especially vulnerable to the impacts of changes in fishery management regulations. The ability of these indices to discriminate amongst a select group of fishing communities demonstrates the utility of the method. For the purpose of SIAs, we argue that changes in fishery management regulations should be considered in combination with nearly ubiquitous gentrification pressure on coastal communities that may compound the impact of fishery management regulations on community well-being. While fishery management regulations constrain fishing effort and affect the coastal economy, the coastal community's dependency on fishing has also increasingly given way to a mix of other economic dependencies that lead to gentrification. The impacts derived from switching to these alternative economies act in concert with fishery management regulations to alter the social and economic context of fishing communities. By examining communities within the context of vulnerability to gentrification, a more complete picture emerges of the range of potential social impacts to fishing communities. Such an analysis can provide a more complete picture of community dynamics and well-being than commonly evident in fishery SIAs. This is important, considering the sometimes accelerated pace of fishery management plan development once regulatory change has been deemed necessary. Having a suite of quantitative data for analysis can help validate or supplement qualitative data that are procured through public testimony or empirical research.

The results reported here are preliminary, but demonstrate the utility of the methods for development of social indices of gentrification. To establish the external validity of these quantitative constructs, that is, ensure the constructs are firmly grounded in the real world; the indices will be groundtruthed over the coming year using key informant interviews, in-depth participant observation, and archival research within select communities. As the database expands to include time series data, comparative assessment of past and future conditions in coastal communities' responses to changes in fisheries management will be possible, further strengthening fisheries SIAs.

References

Boyd, H., and A. Charles. 2006. Creating community-based indicators to monitor sustainability of local fisheries. *Ocean & Coastal Management* 49:237–258.

Clay, P. M., and J. Olson. 2008. Defining "fishing communities": Vulnerability and the Magnuson-Stevens Fishery Conservation and Management Act. *Human Ecology Review* 15:143–160.

Colburn, L. L., and P. M. Clay. 2011. The role of oral histories in the conduct of fisheries social impact assessment in the northeastern U.S. *Journal of Ecological Anthropology* 115:74–80.

Coastal Enterprises, Inc. 2002. Preserving commercial fishing access: A study of working waterfronts in 25 Maine communities. Report for the Maine State Planning Office Coastal Program. State PlanningOffice. State House Station 38, Augusta, Maine 04333-0038. http://www.maine.gov/spo/coastal/downloads/access/presvcommfishing.pdf (accessed November 11, 2011).

Crossett, K., T. J. Culliton, P. Wiley, and T. Goodspeed. 2004. *Population trends along the coastal United States: 1980–2008. Coastal Trends Report Series*. Silver Spring, MD: National Oceanic and Atmospheric Administration.

Folke, C. 2006. Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change* 16:253–267.

Gale, R. P. 1991. Gentrification of America's coasts: Impacts of the growth machine on commercial fishermen. *Society and Natural Resources* 4:103–121.

Gallopín, G. C. 2006. Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change* 16:293–303.

Gulf and South Atlantic Fisheries Foundation, Inc. (GSAFFI) 2010. Development of social indicators for fishing communities of the Southeast: Measures of dependence, vulnerability, resilience, and gentrification. Lincoln Center, Suite 740, 5401 West Kennedy Blvd., Tampa, Florida 33609-2447.

Hall-Arber, M., C. Dyer, J. Poggie, J. McNally, and R. Gagne. 2001. *New England's fishing communities*. MIT Sea Grant College Program. Cambridge, Massachusetts.

Jacob, S., and J. Witman. 2006. Human ecological sources of fishing heritage and its use in and impact on coastal tourism. Proceedings of the 2006 Northeastern Recreation Research Symposium. GTR-NRS-P-14.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2010. Exploring fishing dependence in Gulf coast communities. *Marine Policy* 34:1307–1314.

Jepson, M. E. 2004. The Impact of tourism on a natural resource community: Cultural resistance in Cortez, Florida. Ph.D. Dissertation. Department of Anthropology, University of Florida.

Johnson, J. C., and M. K. Orbach. 1990. A fishery in transition: The impact of urbanization on Florida's spiny lobster fishery. *City and Society* 4:88–104.

Lamarque, J. 2009. The making of a waterfront suburb: An ethnology of coastal gentrification in New Jersey. Ph.D. Dissertation, Graduate Program in Anthropology, Rutgers—The State University of New Jersey.

Lees, L. 2000. A reappraisal of gentrification: Towards a "geography of gentrification." *Progress in Human Geography* 24:389–408.

Magnuson-Stevens Fishery Conservation and Management Act (MSA) 1996. U.S. Department of Commerce. NOAA Technical Memorandum NMFSF/SPO-23 December 1996.

Mederer, H. 1999. Surviving the demise of a way of life: Stress and resilience in Northeastern fishing families. In *The dynamics of resilient families: Resiliency in families*, eds. H. I. McCubbin, E. Thompson, A. I. Thompson, and J. A. Futrell, Vol. 4, 203–235. Thousand Oaks, CA: Sage Publications.

Olson, J. 2010. Seeding nature, ceding culture: Redefining the boundaries of the marine commons through spatial management and GIS. *Geoforum* 41:293–303.

Pollnac, R. B., S. Abbott-Jamieson, C. Smith, M. L. Miller, P. M. Clay, and B. Oles. 2008. Toward a model for fisheries social impact assessment. *Marine Fisheries Review 2006* 68:1–18.

Pollnac, R. B., and J. J. Poggie. 1988. The structure of job satisfaction among New England fishermen and its application to fisheries management policy. *American Anthropologist* 90:888–901.

Pollnac, R. B., and J. J. Poggie. 2006. Job satisfaction in the fishery in two Southeast Alaskan towns. *Human Organization* 65:329–338.

Reeder, R., and N. L. Glasgow. 1990. Nonmetro retirement counties' strengths and weaknesses. *Rural Development Perspective* 6:12–17.

Shivlani, M. 2009. Examination of non-fishery factors on the welfare of fishing communities in the Florida Keys: A focus on the cumulative effects of trade, economic, energy, and aid policies, macroeconomic (county and regional) conditions, and coastal development on the Monroe County commercial fishing industry. Report completed in accordance of MARFIN Grant NA05NMF4331079. US Department of Commerce. NOAA Fisheries Southeast Regional Office, St. Petersburg, Florida 33701.

Valdes-Pizzini, M. 1990. Fishermen associations in Puerto Rico: Praxis and discourse in the politics of fishing. *Human Organization* 49:164–172.

Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. 2004. Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society* 9(2):5. http://www.ecologyandsociety.org/vol9/iss2/art5/ (accessed April 26, 2012).

Yagley, J., L. George, C. Moore, and J. Pinder. 2005. They Paved Paradise . . . Gentrification in Rural Communities. Report for U.S. Department of Housing and Urban Development (HUD), Housing Assistance Council. Washington DC.